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Risks in the Swaps Market

Since its inception in the early 1980s, the market for the financial instruments called swaps has grown phenomenally. As of December 1991, the latest date for which data is available, the underlying notional principal on all outstanding interest rate swaps with payments made in dollars was about $1.5 trillion.

As the market has grown, so has the role of banks, both as principal parties, to the swaps and as intermediaries. This latter role, in particular, has raised concerns among regulators about the risks swaps pose, not just to the banks involved, but to the financial system as a whole. This *Letter* discusses these potential risks and concludes that most of them are adequately managed and controlled. The exception may be the "systemic" risk of a financial shock being transmitted throughout the financial system through the swaps market, though the significance of this risk is unclear. To the extent that it is of concern, it could be mitigated by imposing more rigorous reporting of swaps transactions.

An interest rate swap

There are many kinds of swaps, for example, currency swaps and equity swaps, but the most popular kind is an interest rate swap. An interest rate swap is a contract under which two parties agree to exchange floating and fixed interest payments on a stated amount of principal. The principal, called a "notional principal," is used merely to calculate the reciprocal cash flows between the counterparties and usually is not itself exchanged.

Counterparties have different reasons for entering into interest rate swaps, but one of the most common is to hedge interest rate risk. Imagine a firm, say a thrift, that has short-term liabilities such as 3-month certificates of deposit (CDs), and long-term, fixed-rate assets, such as 30-year fixed-rate home mortgages. If interest rates rise unexpectedly, the thrift will lose money, because the interest rate that it pays on its CD liabilities will rise, but the interest rate it receives on its mortgages will not. Conversely, the thrift will benefit when market interest rates fall. Now imagine a second firm whose assets yield a return that fluctuates with market interest rates, but whose interest payments on its liabilities are fixed for a longer period of time. This firm will lose money when interest rates fall and make money when interest rates rise.

Both parties can reduce their sensitivity to interest rate fluctuations by entering into an interest rate swap with each other. In this example, the swap contract specifies that the thrift, which has fixed rate assets, will essentially take over some of the interest payments of the second firm, which has fixed rate liabilities. The second firm will take the opposite position, using its returns on its floating rate assets to take over some of the floating interest payments of the thrift. For example, if the thrift's CDs have interest rates that fluctuate with the 3-month Treasury bill interest rate, it can agree to pay the second firm a fixed rate of, say, 6 percent, on an agreed upon principal in exchange for a floating rate payment of the 3-month Treasury bill rate on the same principal. Often, the fixed rate, 6 percent in this example, is determined by the interest rate prevailing at the time that the swap is originated on a security of equal maturity to that of the swap, say the 10-year Treasury note rate.

Of course, finding a match for a swap can be as hard as finding a match for a marriage, and this is where intermediaries come in. While many banks are themselves principal parties in the swaps market, large banks are more extensively involved as deal-makers, or intermediaries. Intermediaries typically act as counterparties themselves, thereby "making a market," and earn profits by receiving higher fixed rates than they pay. For example, say a bank stands between the two counterparties by requiring that the thrift pay it, say, 6 percent *plus* 50 basis points and then passing on only 6 percent to the second firm.

Price and credit risk

When assessing the profitability of acting as a swap dealer, a bank will likely take into account the risk that it faces. There are two major kinds of risks banks consider. The first is price, or market, risk, which means that if interests rates change, the bank may lose money. For example, if the

bank as intermediary is receiving a fixed rate and market interest rates rise, then, the bank's counterparty's fixed-rate payment is below the new market rate and the bank loses money on what was, at origination, a "fair trade."

Because the bank's main purpose as a dealer is to earn a positive bid-offer spread (the difference between the fixed rate received and the fixed rate paid), it will attempt to hedge its swap positions with a combination of offsetting swaps, futures, options, and Treasury securities. Ideally, these hedges offset the bank's cash outflow (inflow) on the various swaps with a cash inflow (outflow) of equal magnitude. However, most bank dealers find that they cannot perfectly hedge their positions at all times, and, consequently, they face some risk from changes in market interest rates and spreads.

The second major type of risk that a bank faces as a swap dealer is credit risk, the joint risk that the bank's counterparty defaults and that interest rates or bid-offer spreads have changed in the bank's favor since origination, so that the defaulted portion of the swap would have had positive economic value. For example, if the bank is receiving a fixed rate and market interest rates decline, then the counterparty's fixed-rate payment is above the new market rate. If the counterparty defaults, the banks loses the benefit of those above-market rate payments.

There is no complete hedge against the credit risk that a bank faces as a swap dealer. However, certain common practices generally do provide some protection against credit risk. For example, intermediaries can choose to deal with relatively low-risk counterparties and reject relatively high-risk counterparties or require them to collateralize their swap position. And, unlike a collateralized loan, where the lender cannot liquidate the collateral following the filing of a bankruptcy petition, the collateral underlying a swap may be liquidated. In addition, swap contracts with maturities over ten years generally specify that if either counterparty falls below investment grade, the other counterparty has the right to liquidate the swap at its market value at that time, while the deteriorating counterparty still is solvent. Also, most or all bank dealers have formal limits to assure that credit risk exposure is not excessive. For example, most banks set a limit on their total credit exposure, arising from any of a variety of financial arrangements, to any one counterparty. Banks also may have a lower exposure limit for riskier counterparties.

Risks as seen by the regulators

Regulators' main concerns with regard to risk are the expected liability to the deposit insurance fund and "systemic risk," the risk of a destabilizing disruption of the financial markets. Furthermore, the concern with respect to deposit insurance arises only as a result of "excessive" risk-taking on the part of a bank which either is deliberately exploiting the deposit insurance system by increasing its positive deposit insurance subsidy or simply is ignorant of the risks that it may be undertaking.

The swaps market may offer banks some opportunities for exploitation of the deposit insurance system. Specifically, banks can leave their swaps unhedged and thereby speculate on interest rate movements, or they can engage in swaps with unusually risky counterparties. The latter strategy might be followed if swap pricing is such that the expected return on a swap is higher the riskier is the counterparty, as is the case at some banks.

However, such behavior is not likely to be widespread. For example, other instruments, like Treasury securities, tend to have lower transactions costs and also can be used to speculate on interest rate movements. In addition, the strong predominance of relatively low-risk counterparties suggests that the use of swaps as high-credit-risk, high-payoff ventures is not widespread. Therefore, it is likely that excessive risk-taking with swaps, if it exists, usually is unintentional.

Whether intentional or not, however, regulators have recognized the risk inherent in swaps and have taken it into account in the new risk-based capital requirements for banks. These rules require that, at a minimum, a bank hold capital equal to 8 percent of "risk-adjusted assets." They reduce incentives for risk-taking through swaps by including swaps in the calculation of risk-adjusted assets. The requirements state that half of the sum of (1) 0.5 percent of the notional principal of a swap with a life of more than one year and (2) the market value of the swap, if it is positive, is to be included in risk-adjusted assets. (If the value of the swap is negative, the market value is treated as zero for purposes of computing risk-adjusted assets.) Thus, investment in a

swap requires some commitment of capital, and this reduces the risk of bank failures because capital acts as a cushion against losses.

The capital requirement also reduces the possibility of a destabilizing disruption to the financial markets as a result of "systemic risk" from swaps. Systemic risk in this context means that a bank could become insolvent, perhaps for a reason that has nothing to do with swaps, but, because swaps dealers tend to have numerous swaps deals with each of the other dealers, a problem at one bank could be transmitted to other banks and ultimately cause multiple failures.

Narrowly interpreted, this scenario would require that swap losses really be large enough to cause insolvency, that is, to deplete capital. This is unlikely. In one recent study, total actual losses from default on swaps were estimated to be about two-one hundredths of a percent of the outstanding notional principal amount. Because the average notional principal amount of a swap contract is about $25 million, potential losses on individual swaps can be estimated to be about $500,000. Of course, some banks inevitably will face larger actual losses and others smaller. However, the minimum amount of capital held by the major bank swaps dealers is about $1 billion, and most hold considerably more. Therefore, it seems unlikely that swap losses, at least as a result of counterparty default, could by themselves cause a bank to fail.

However, there is a broader interpretation of the systemic risk problem in connection with swaps. The swaps market is a web of interrelationships, but those interrelationships are obscured to both the market and regulators because there is no official record of swaps transactions. This means that swaps could exacerbate contagion problems, wherein a strong external shock such as a sudden extreme change in interest rates or a global stock market crash, causes financial market gridlock because of a lack of information. Specifically, market participants may not be able to identify accurately which banks are in danger of failing as a result of such a shock, and, consequently, financial contracting may stall until swaps and other interrelationships are sorted out. Moreover, financial market disruption may be widespread because the "derivatives" market as a whole, of which interest rate swaps are a part, extends into many other markets, such as foreign exchange, commodities, and stock markets.

Despite the apparent gravity of such problems, the true significance of this risk remains unclear. Nevertheless, it is important to consider what might be done to address such a problem. In other interbank financial markets, such as the federal funds market and the interbank deposit market, as well as in other financial markets, such as the stock market, participants report transactions on a real-time basis to the Federal Reserve, to some other regulator, or to an exchange. If swaps participants also reported their transactions, then swaps contracts could be traced to sort out counterparties' obligations, thereby minimizing any financial market disruption resulting from a shock to the financial markets.

Conclusion

Risk in the swaps market has attracted much attention recently. A review of the nature of swaps contracts and their risks shows that banks' own risk management, the risk-based capital requirements, and the relatively low default rate on swaps make it unlikely that swaps will, by themselves, transmit problems that result in insolvencies from one bank to another. However, because of the relative opacity of the interrelationships within the swaps market, swaps might exacerbate contagion problems and systemic risk, although the true significance of even this risk in the context of swaps is debatable and requires further study. Should such risk be deemed significant, it could be mitigated by requiring participants to report all swaps transactions on a timely basis. However, the advisability of such a requirement depends not only on a more detailed assessment of the likely benefits, but also on input from swaps participants themselves regarding the likely costs of such reporting and its impact on the vitality of this important market.

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